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The economic role of valuers in real property markets

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Abstract

Globally, real estate trade is highly regularized. Usually, the market value is not negotiated simply between the seller and potential buyer but based on an assessment performed by a professional valuer, known as a surveyor or appraiser. This paper inquires about the economic role of valuers in real estate markets. An institutionally embedded framework for valuation intermediation is developed that elucidates a multi-tiered imperfect information cascade. First, the valuer is understood as middleman counteracting information uncertainties on product quality of real estate. An additional constraint is constituted by information asymmetries between valuer and contractor. Drawing on New Institutional Economics, we discuss how the valuation professional with regularizations evolves globally as the superior institutional response to this cascade of information imperfections. A case of empirical evidence is provided for this concept of the regularized valuer.

Keywords: Transaction Costs; Asymmetric Information; Property Law; Information and Product Quality; Real Estate Services; Contaminated Land

JEL-Codes: D23, D82, K11, L15, L85

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1. Introduction, aims and scope

The global financial crisis and the turmoil wreaked by and on the real property markets in 2008-9 have brought about a renewed interest in the role of valuation and its regulation (Źróbek, Adamiczka, and Grover 2013). In economic terms, real estate can be defined as a 'rivalrous' and 'excludable' good. As such it lends itself to private ownership and trade in free markets. Characteristically –assuming no market failure–, its price reflects both the costs of production and provision as well as the willingness to pay for holding this ownership in expectation of the benefit that can be derived from it. If real property was just such a private good, prices should be determined without (public regulatory) intervention on the simple basis of an 'invisible matching' of demand side preferences and supply side costs. However, far from being a result of direct negotiations between the demand and supply side, pricing in the realty market is regularly based on professional valuation. Over the last century the profession of appraiser (or surveyor) has emerged worldwide[1] within distinct organizational structures; for a fee, the valuer provides the service of determining the price of realty (Closser 2007, Jefferies 2009, Morgan 1998, Ramsey 2004); we will refer to them in the following as 'valuers' or a male pronoun. Real property as estate seems to have characteristics that go beyond those of a 'private good', making it beneficial for buyers and/or sellers to involve the valuer as an additional third party actor in the transaction – even if this means paying a significant fee.

Looking into the role of valuers in the real estate market entails studying how they assess market prices as well as the role they play as a third party in the realty market. With regard to price formation, a rich body of literature exists that looks at a variety of issues, ranging from price prediction methods (for an overview see Pagourtzi et al. 2003, Cannon 2002) and the determination of values by means of, for example, hedonic pricing methods (for example see Rosen 2002, Grether and Mieszkowski 1974) through to the study of market cycles (Grenadier 1995, Born and Pyhrr 1994) and advice on how to monetize external effects (e.g, Endres and Fraser 2011). With regard to the role of third party intermediation or

[1] The International Valuation Standards Council lists "Valuation Professional Organisations" members from 43 countries on all continents (Council 2015) and includes as member the Royal Institution of Chartered Surveyors (RICS) which itself is promoting standards in 66 countries according to its website as of 20 Jan 2015.

of middlemen in markets, an extensive literature exists analysing market frictions brought about due to a complex matching process between market actors (based especially on Rubinstein and Wolinsky 1987) or imperfect information on product quality (e.g. Biglaiser 1993), both of which are also applicable to the analysis of real estate markets. What is lacking to date, however, is a conceptual integration of both lines of inquiry, i.e. a concept that integrates theories of price formation (and regulation) and theories of intermediation in real estate markets. Moreover, linking such analysis to the institutional context of regularization is a new field of inquiry. Our contribution seeks to undertake this integration in order to answer the questions such as: (1) Why do market participants pay for property valuation? (2) What is the role of the valuer in transacting real property sales? (3) What roles do play the professional, regularizing and real estate specific settings that frame the valuers' activities?

To accomplish these aims, we begin with a thorough characterization of (1) real property as an economic good, (2) the realty market and its actors, and (3) the market institutions of the valuer and the valuation profession. Based on this, we outline the conceptual framework of the valuer in their dual role as broker and agent of information (Section 2). We then use this dual role framework as a background to explore and discuss the potential of different economic concepts of imperfect information covering information asymmetry, information acquisition, information brokerage and expert knowledge (credence) to support and augment our understanding (Section 3). Section 4 expands our conceptual framework by investigating concepts on the emergence of professional associations and on the specific regularization of nature-related transactions. In Section 5, we present an empirical case that confirms our dual role concept of the valuer and the need for institutional embedding: here, market failure resulted from a malfunction of the valuation process in a specific nature-based transaction, namely, valuation of the market risks of contaminated land. The final section offers some concluding remarks.

2. Characterization

2.1 Real property as an economic good

Real property is a specific economic good that differs crucially from other economic goods. First of all, physically speaking real estate is a particular piece of land on the Earth's surface along with the things that are semi-permanently attached to it, such as buildings, trees, soil and subsoil properties, such as underground storage tanks. In addition to the real estate itself, real property includes all the interests that are attached to the property (according to national legislation). These may include future use rights, tenancy rights or easements. Actually, the key characteristics of real property as an economic good are its immobility and its separateness in relation to the specific social and natural attributes found in its unique location. The spatial dimension of real estate is a given in any transaction. In addition, real estate trade is strictly regulated all over the world. There is practically no other good whose property rights are so well-defined and so strictly controlled, e.g. by zoning laws. The exclusiveness and singularity of a piece of land within an environment (that might change over time) determines a real estate's usability, which in turn affects its economic value. Regulation can and usually does limit usability, as when municipalities influence the planning and approval of specific uses. Although, strictly speaking, there cannot be two identical real estates, real properties are to a limited extent (spatially and temporally) substitutable based on the competing use options they provide within their settings (Holthaus 2007).

Each unit of property is characterized by heterogeneity arising from at least four dimensions within which it exists: in addition to the two-dimensional shape of the plot, the vertical dimension unique to the location also determines the possible utility of a piece of land (as, say, in the case of mineral resources beneath the ground, or sub-soil contamination, or airport landing flight paths overhead). An additional element of heterogeneity consists in the fourth dimension of 'time', which can materialize as imminent use restrictions or impacts of previous uses of a site on its current and future value – sometimes known as 'shadow effects'. The assessment of all these dimensions of heterogeneity relates to risks and uncertainties; subsequent impacts of a site's previous use, for example, can have a considerable influence on the economic value of a piece of real estate (Bartke 2011, Syms 2010).

In the introduction, land was briefly categorized as a private good due to its characteristics of rivalrousness and excludability. As Holthaus (2007) suggests, from an investment point of view real property is a capital asset which is owned in order to make a profit, this being comprised of the net proceeds from its sale or the monetized regular net cash flows that result from the surrender of use to third parties. Holthaus (2007) highlights the specificities of realty with regard to its lengthy process of development and its duration as well as the long-term high level of capital expenditure required for investment, with revenues being distributed over a long period. In a production theoretical framework 'land' is a factor of production (a resource) rather than an economic good (for an overview of the changing concepts of 'land' and its valuation in orthodox and heterodox economic theories see Hubacek and van den Bergh 2006, and Ramsey 2004). Unlike most goods and resources real property is not used up during its use. Instead, the derelict land and so-called brownfield sites that emerge upon cessation of economic activity on a piece of land are regarded as having a temporary status within a property's life cycle (Ferber and Preuß 2008). Hence, the value of the realty is not determined in a cost of production approach and imputed profits but is rather the current value of the revenues that can be generated over its future lifetime, taking into account its best usability in its unique social and natural settings.

Given this persistent heterogeneity and complexity, we conclude that risks and uncertainties relating to the usability of a piece of land are a key characteristic of real property in terms of its quality and thereby its value as an economic good. In the following, we choose not to take into account environmental externalities or physical or economic spill-overs between different pieces of land, such as landscape aesthetics, visibility or other 'shadow effects'. We do this in order to make our analysis easier – however, we strongly emphasize that land is a multifunctional natural resource with public good characteristics in that it provides essential ecosystem services such as supplying food, fuel and fibre (for the ecological importance of land see, among others, Dominati, Patterson, and Mackay 2010, Wall and Nielsen 2012, Gardi et al. 2014, Amundson et al. 2015). This poses complex analytical challenges, not least when it comes to taking the sustainable development imperative seriously (c.f. Bartke and Schwarze 2015). We assume here that it is not market failures caused by such externalities that cause market frictions that explain the emergence of the valuation profession. Instead, we posit that the characteristics of real property inherently entail profound information imperfections and asymmetries due to uncertainties resulting from the complexities described above, which in turn explain the valuer's role.

2.2 Real property market

As stated above, real estate is an economic good, for which in most parts of the world defined property rights exist and are enforced. Hence, a stable 'legal environment' for the real property market is a necessity for property to be traded between individuals (or indirectly via real estate agents). The realty market can be divided into private, commercial and public interests, according to its respective legal setting, and also into different submarkets (for example for housing see Bourassa et al. 1999, or for office submarkets see Dunse, Leishman, and Watkins 2001).

All these markets are characterized by decentralized trading – especially when a piece of real estate is to be utilized for construction or cultivation purposes and not just as a financial investment. Moreover, as real property demands long-term large-scale investments its purchase (sale) is transacted infrequently. Hence, we have markets where trade takes place comparatively irregularly. As a result, we find neither rational expectations with individual buyers or sellers nor a simple market point; in other words, properties are not traded in a single central location such as a stock exchange but rather in multiple decentralized locations, and this trade is itself characterized by complexities in which risks and persistent uncertainties have to be considered. These inherent 'market risks' are often site specific, as they are defined by the above-mentioned dimensions of land (3D space and time). They can also cause market failures – even if external effects (negative ones such as noise, odour or air pollution, but also positive ones such as the amenity of a sea-view) are excluded – because the information about them that is available and the way they are perceived by the trading partners may affect tradability to the point of market breakdown. For example, market risks and uncertainties often originate from market conditions such as easements or other third party interests, trespassing, rent default risks, financing default risks, contamination risks from previous use and so on. These all affect the assessment of the piece of land's quality and value to such an extent that land may be traded less frequently or not at all (as we will demonstrate in Section 5). Several instrument-based approaches could address these market risks in order to internalize them within a value assessment (liability, compensation, taxation) (see, for example, Kunreuther et al. 1987, Syms 2010). We will now explore the role of valuers as professional intermediary agents.

2.3 The valuation profession

The role publicly ascribed to the valuer is to deliver a valuation report, which "*is used by both parties* [buyer and seller] *to set the sale price of a property.*" (2014). In practice, the valuation professional provides guidance to his contractor on the fair market price of a piece of real estate in a written survey or report that describes in detail how the assessment of market value has been undertaken. Contracting parties can have very specific objectives other than buying and selling of land, for instance, if land is assessed as a security for a loan or as basis for taxation. In the following we will refer to the real estate's market value as basis for transacting the ownership of the piece of land.

Bird (1938) pointed early on to the latent shortcomings of such assessments due either to a lack of effective professional standards, objective measurement devices or to distorted concepts applied in lieu of personal interests. Hence, most normative approaches to appraisal state that valuation should be conducted 'impartially' and 'independently', irrespective of the valuation results a client would like to see. As West (2014) puts it "*I like to think of appraisers as warriors for the truth: the true client for the appraiser is the public trust.*"

Professional standards and even national laws reflect this role of valuers and of valuation. Valuation is the assessment of the 'most likely value of a property'. According to the International Valuation Standards Council (IVSC), market value is defined as "the estimated amount for which an asset or liability *should* exchange on the valuation date between a willing buyer and a willing seller in an arm's length transaction, after proper marketing and where the parties had each acted *knowledgeably, prudently and without compulsion.*" (IVSC 2013, 5; emphasis in italics added by the authors). Market participants are thus expected to be well informed and to act in what they consider to be their best interests.

Valuers are regularily organized in professional organizations. Under professional, statutory, international, national or local laws or regulations a vauler is usually required to develop his appraisal reports subject to the principles, guiding norms of good practice and appraisal methods codified in international standards (IVSC 2013) and regional standards (see for example Rudolph 1998). Despite ongoing debates over the differences between nationally recommended methods, they can be expected to lead to comparable results (Schnaidt and Sebastian 2012). Hence, a valuer is not to be seen merely as an individual professional expert but rather as an actor operating in a regulated environment (see Ramsey 2004).

Valuers should be regarded as separate from real estate agents (brokers or dealers who sell and buy properties or based on a consignment procure them on behalf of a third party). Both agent and valuer are normally more familiar with the property market than the average buyer or seller. Potentially, both can capitalize on this superior knowledge to the disadvantage of their client. However, whereas the agent is expected to act in the sole interests of the party that commissioned the service, the valuer is supposed to take an objective and neutral stance when conducting a valuation in order to determine a fair market value. For agents, behaviour guided by self-interest is well documented (for example by Levitt and Syverson 2008, Hackett 1993). An intermediating valuer who provides an expert assessment on a property's price is clearly in a different postion. His role might be best described by objectively assessing the various market risks and uncertainties involved: in other words, valuation is a generic approach that is about objectifying the key dimensions of quality of land. Valuers should not give their subjective opinion on value and neither should they exploit market opportunities for the benefit of their contractor. Instead they should provide a well-founded expert assessment of fair market value, including an assessment of the prevailing market risks.

2.4 A simple property market framework

In concluding this characterization of the real estate good, market and valuer, we note that there is a link between the economic good and market characteristics of land on the one hand and the role of the valuation professional on the other. The nature of this link essentially reflects the fact that most of the quality characteristics of a piece of property are related both to the specific product (i.e. site) and to market risk and uncertainty.

According to economic orthodoxy market price is the single coordinating market mechanism needed to effect a transaction between buyers and sellers. But as Coase (1937) pointed out, institutions evolve next to the pure market mechanism (e.g. firms and other organizations) in order to reduce transaction costs. The Coase'ian transaction cost approach[2] enables us to establish an initial outline of the economic role of valuers as an 'institution' that reduces uncertainties and market risks in a structured process of intermediation. As an experienced 'market maven' the valuer takes up an intermediate position as an expert on

[2] The understanding of transaction costs (TCs) in this approach includes expenses incurred by using the market as vehicle in order to transact a good. TCs include search, information and bargaining costs.

establishing the quality of land and, based on this expertise, he is assessing the potential benefits (based on the best usability) and, accordingly, the value of this economic good. As a result, we have a setting where land supply and demand are not negotiated directly between the seller and potential buyer but through the intermediating valuer, who provides a valuation report aimed at reducing the risks and uncertainties in the complex realty market.

Taking this simple transaction cost framework (cf. Figure 1) as a starting point, we explore different economic theories to shed more light on this conceptualization.

Figure 1: Simple property market framework with information intermediation

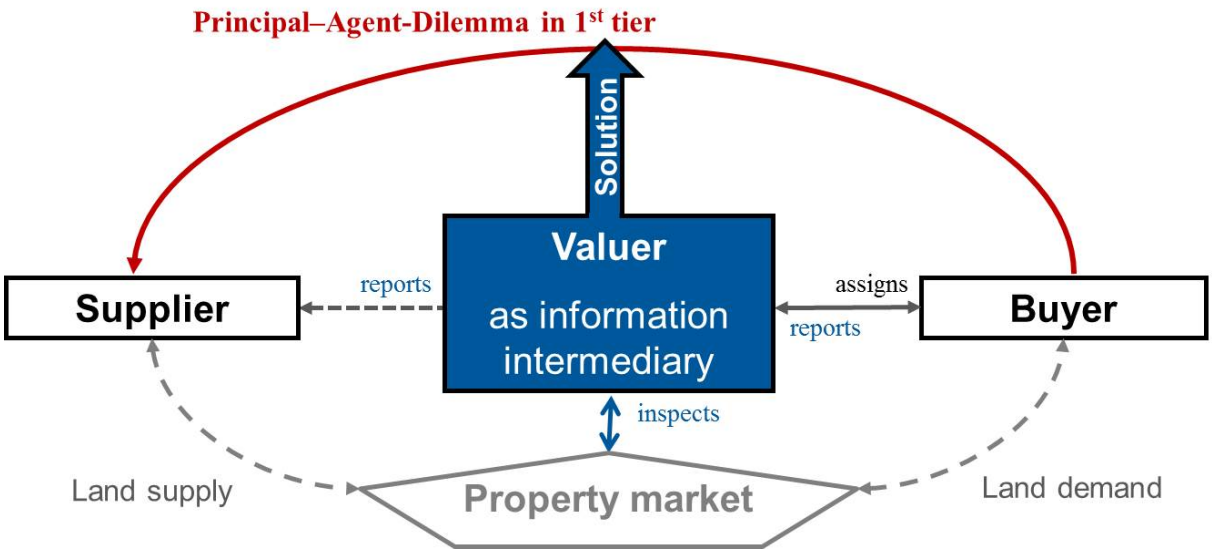

Figure 1 presents a simple property market framework with valuers as information intermediaries solving the principal-agent-dilemma between a supplier and a buyer of land meeting at the property market.

3. Information economic approaches

Despite the prevalence of the valuation process and the existence of numerous legal analyses, economics-based concepts, theories and models are relatively sparse, as are relevant empirical studies. In order to substantiate our cascade conception of the valuer in an imperfect information environment, four strands of literature from information economics and from research on the agency dilemma are of particular relevance, and it is these we will revisit next: 1) the way prices are determined in markets under incomplete information has been examined frequently since the landmark articles by Akerlof (1970) and Klein and Leffler (1981); 2) information acquisition strategies used by the demand side to mitigate informational disadvantage have been found by Nelson (1970) to be reflected in corresponding market settings; 3) information brokerage through intermediaries as one promising form of a market setting has been modelled by Biglaiser (1993); and 4) the credence problem can give rise to an additional agency dilemma in addition to the classical moral hazard problem if the information broker is ascribed with the role of a trusted expert.

3.1 Information asymmetry and the demon of market collapse

To assess the quality of a good, it is essential to have sufficient information about it. Lack of information has been discussed as a particular problem in the case of asymmetric information, that is, when one party to an economic relationship or transaction, e.g. the buyer of a plot of land, has less information about it than the other parties, e.g. the seller – in the following, we focus on points in time prior to commitment to a contract. Such asymmetry is given when search and information processing costs are prohibitively high. Hence, the buyer/ investor is not sufficiently informed about the quality of a product ahead of the transaction.

The classic example is from Akerlof (1970): the market for used cars, in which potential buyers are unable to know for sure whether a car has been kept in good condition or not. The same situation characterizes the market for real estate, where market risks can occur out of a long history of natural or anthropogenic use. Akerlof (1970) suggests that there is a relationship between product quality, price (as potential marketplace signal of quality) and the uncertainty related to ascertaining this information about quality. The market for real estate is arguably one in which the quality of the good concerned is difficult for buyers – and sometimes for sellers themselves – to assess. For the moment, let us assume that the supplier of a piece of land has comparatively more knowledge of its characteristics than the buyer.

Akerlof (1970) demonstrates that this situation encourages suppliers to offer low-quality goods because yields of high-quality goods accrue to all providers rather than only to the high-quality suppliers. Buyers, however, make assumptions about the average quality in the market and determine their willingness to pay on this basis. High-quality suppliers will not sell at the price level that reflects the average quality; hence, the best quality goods disappear from the market. Henceforth, the average quality declines further and this in turn further reduces the buyers' willingness to pay – in equilibrium, the market collapses. Market failure occurs because no high-quality objects are sold in the market due to the prevailing information uncertainty – even though buyers are positively willing to pay for them. If consumers cannot detect quality, low-quality goods will crowd out the high-quality items. From this, then, we can conclude that price as information might not help achieve efficient market equilibrium under asymmetric information. In subsequent research, it has been shown that such markets may be characterized by multiple equilibria representing a distribution of prices with excess supply at some or all of the prices (Rose, 1993; Wilson, 1979, 1980). As Akerlof (1970) indicates, the solution to this situation is the provision of information and signals. Signals work if costs to provide them are high for suppliers of bad qualities and low for good ones: e.g. a diploma in the labour market; product warrantees; certification – but what works in the real estate market?

Whereas Akerlof (1970) is often perceived as explaining the potential of market collapse in the face of informational asymmetries, Klein and Leffler (1981) made clear that multiple equilibria are possible because suppliers can increase trust in their quality claim by investing in nonsalvageable assets (e.g. advertising). Shapiro (1983) introduces reputation building via a strategy of selling high-quality goods at the low-quality price in the phase of market penetration, and Allen (1984) models buyers as having the ability to deduce product quality based on the seller's offer of price and quantity (for an overview on this research strand cf. Clerides, Nearchou, and Pashardes 2008).

The phenomenon of imperfect information also motivated research into the so-called 'agency problem' or problem of 'principal and agent' (PA) (for example Rees 1985a, b). Several solutions to the PA problem (such as screening, signalling, pooling of risks, contracting) have been proposed as a way of providing incentives for the agent not to shirk the principal (e.g. between employer and employee, lecturer and student, voter and politician). Interpreting the relationship between the seller and the buyer from the viewpoint of the PA literature, we find that the seller of a property, who is assumed to have more

specific knowledge about a piece of real estate (at least regarding its recent and current use), effectively acts as the agent and that the potential buyer of that real estate acts as the principal, because she has to pay a price and trust that she is receiving the necessary information from the realty owner to be able to ascertain its quality prior to the transaction. We do not want to discuss the agency dilemma and the related literature in detail here (see Stiglitz 1987, Sappington 1991, Ross 1973), but it is obvious from the previous discussion that institutional strategies need to be established to overcome the market frictions caused by asymmetric information. The PA problem defines the first tier of the imperfect information cascade in property valuation.

3.2 Strategies of information acquisition – the buyer's perspective

A triad of methods consisting of screening, signalling and pooling, together with various contracting mechanisms, is classically deployed to overcome the principal agent problem in markets. We have identified the buyer as the weakest party in the realty market. She suffers most from the shortage of information and therefore has an incentive to overcome this disadvantage. We will look next at her potential strategies to improve the situation, taking as our point of departure the general economics literature that discusses how information is obtained on the demand side.

Stigler (1961) introduces the economics of information and the vital role of search costs. Assuming decentralized markets with varying prices, he defines search costs as costs attached to identifying the market actor that agrees on the most favourable price. Given that the information gained from receiving different price quotations from sellers is worth more than the costs of the search, it will be worthwhile, on average, for buyers to undertake it.

In a related approach, Nelson (1970) discusses the consumer's quest for information, although here the focus is not on prices but on the quality of goods. He, too, points out that information acquisition is costly. He identifies two distinct strategies for acquiring information: Adapting Stigler (1961) position, Nelson understands 'search' to mean careful consideration of the utility of randomly sampled purchase options prior to buying. Here, the consumer optimizes her number of searches until the marginal return of the expected best option is less than the marginal cost of the search. This marginal cost is modelled as being dependent on frequency of purchase, time and costs. A different purchasing strategy is based on experience. An assessment of product quality is done by repeated purchasing – in other words by learning and up-dating experience from previous purchases. This strategy is most

efficient when search costs are high, e.g. in the case of appliances, as Nelson (1970) illustrates – the author distinguishes such 'experience goods' from the 'search goods' discussed before. Real estate arguably also falls within the 'experience' category of goods. In the Nelson (1970) model, the marginal cost of information acquisition by experiencing goods depends on the expected mean of the utility distribution. The marginal benefit equals the present value of purchases over time depending on the frequency of purchases and further on the buyer's discount rate. Although the selection of goods needs to be done at random, prior information can be taken into account, not least of which includes the recommendations of others, i.e. the effect of 'guidance' (for the case of advertising cf. Nelson 1974); *nota bene*, we consider an expert's opinion also to qualify as 'guidance' which a buyer will consider. Nelson (1970) distinguishes durable from non-durable goods considering the frequency of purchase. He concludes from his model, 1) more 'guidance' will be used for durable than non-durable goods and 2) more 'guidance' will emerge in the case of 'experience goods'.

As discussed in Section 2 above, real estate can arguably be classified as a durable, rarely transacted good, where high search costs have to be invested in order to ascertain the true quality of the product. We can classify it according to Nelson (1970) as a durable and an experience good and deduce from his analysis that expert guidance and decentralized structures are to be found in the real estate market. In evolutionary economics terms, we might even conclude that the realty market is predestined to develop a third party institution as an intermediary who provides 'guidance' for the buyer's assessment of quality in order to overcome the latter's information acquisition problem – thereby potentially solving the PA problem in the first tier of our imperfect information cascade. But are new inefficiencies created if this third party enters the picture as a middleman? In the next section we review the literature on intermediation to answer this question.

3.3 The valuer as intermediary in an extended principal agent setting

The economic advantage of intermediation is often related to the pooling of risks and the higher return on investment gained by monitoring such clusters of risk instead of making an individual investment. Key examples are provided for financial intermediation (Benston and Smith 1976, Diamond 1984). Rubinstein and Wolinsky (1987) present a seminal general model of the activity of middlemen where the process of matching intermediaries to their clients is shown explicitly. Transaction costs that arise from time-consuming matching processes between buyers and sellers are obtained endogenously in the model. The authors

show that transactions mediated by middlemen coexist alongside the direct transactions conducted between suppliers and consumers – as occurs in the realty market where many (though admittedly not all) transactions are mediated. This model helps us to understand the extent to which middlemen evolve endogenously as an institution. Trade frictions are found to be the key drivers of the emergence of intermediation as they allow the middlemen to realize gains by enabling sellers and buyers to transact in a shorter time. The authors show that middlemen are a contributory factor in stable market equilibria.

Notably, Rubinstein and Wolinsky (1987) do not discuss the quality aspect of the goods transacted. They assume homogeneous quality and show how middlemen can reduce search costs related to matching. Following Biglaiser (1993), Biglaiser and Friedman (1994) and Li (1998), another strand of literature analysed market settings in which product quality is scattered and cannot readily be observed. Here, intermediaries emerge and improve welfare in a market as they can invest in expertise empowering them to detect the quality of goods.

Wright and Wong (2014) have recently reviewed the literature which develops theories of middlemen, or intermediaries, based on the Rubinstein and Wolinsky (1987) model – the authors themselves analyse the trade that includes chains of intermediaries in markets with frictions. We take a closer look here at Biglaiser (1993), as in our view his model represents the best conventional economics understanding of the role of the valuer. In many markets there are said to be middlemen who participate in trade without physically altering the good or receiving a consumer surplus. These agents profit from buying the good from one individual and selling it at a higher price to another. Biglaiser (1993) shows that middlemen diminish the adverse selection problem by becoming experts: after a significant sunk cost investment of X in skills, they are qualified to identify a good's true product quality – at a cost of $\zeta_I(X)$ per inspection (with $d\zeta_I(X)/dX<0$). Biglaiser shows that if transaction costs were low and considerable differences in the product qualities of goods existed, then a middleman would provide welfare gains, as "*the gains from a middleman being an expert reduces the loss in surplus due to bargaining inefficiencies (signaling) and resolves the adverse selection problem*" (ibid, 220). He postulates that his "*analysis* […] *can also be viewed as providing a justification for why there are professional appraisers* […]. *An appraiser (referrer), like a middleman, is an expert in his field. For* [him …] *not to cheat, his future profits must be high enough so that any bribe a low-quality seller is willing to offer him to misreport the true quality of the good is not high enough for him to want to cheat the buyer*" (ibid, 213).

To prove his claim regarding the welfare improving existence of middlemen, Biglaiser (1993) first designs a model without them. He assumes that sellers know about the quality of the good that they possess. In the model, the owners value low quality goods at zero and high quality goods at $(1–\delta)U_H$ with δ representing a discount factor. Buyers value a good at $D(V_i,P)=V_i–P$, where P represents the price (or, for us, the market value) and V_i the quality being either high (V_H) or low (V_L). It is assumed that $V_H>V_L>0$ and $V_H>U_H$, which means that gains from trade are possible.[3] Over time, new buyers and sellers can enter the market, with a proportion of λ sellers having a high quality good (1-λ having a low quality good – e.g. a contaminated plot of land). At birth, agents decide in the Biglaiser model whether to enter the market as buyers or sellers, a decision related to fix costs $C_B>0$ and $C_S>0$ which reflect meeting costs and other transaction costs. The market itself is represented as a bargaining game between a buyer/seller pair. The buyer's expectation μ of matching with a high quality seller *H* is said to be common knowledge.[4] Trading takes place for a time (*t*) and a price (*p*), which is described by the density $g(t,p|\mu,s)$. Biglaiser (1993) shows that under the condition $(1–\lambda)V_L+\lambda V_H<U_H$, which is similar to the Akerlof (1970) model, welfare does not reach the first-best level – inefficiency arises in the form of delays in trade between a high quality seller and a buyer due to adverse selection. This leaves room for the emergence of middlemen. Yet, like buyers and sellers, middlemen themselves incur costs C_B and C_S. They can choose whether to inspect a good at costs $\zeta_I(X)$. They can decide to pay the price $P_i(\mu)$ in one period of the game and to offer the good at P_{Mi} to a buyer in the next period. To prevent fraud, a middleman in the Biglaiser (1993) model needs to be punishable by a disappointed buyer.[5] For example, he may offer a warranty that a good will be exchanged if the buyer is not satisfied: "*A middleman may not profit from cheating*" (Biglaiser 1993, 217). To stay in the market, he must make a positive profit. In the market equilibrium, all *H* type sellers sell their goods to the middleman. Moreover, the model assumes that the identity of intermediaries and their ability to detect the true quality of a product at all times are common knowledge. Whether or not the existence of a middleman in the market increases welfare will depend on the magnitude of the transaction costs C_B and C_S and on the average quality of a

[3] In the specific case of real estate, many counter examples could be presented where trade is not beneficial and where theoretically a negative value would adequately describe the property's quality.

[4] Again – for realty this 'common knowledge' assumption is debatable in particular for first time market participants, who will certainly have very restricted information about market conduct.

[5] This is a critical assumption: Middlemen must be punishable if they give misleading or false information on quality.

good being low. – Interestingly, Biglaiser (1993) discusses the options of signaling to reduce information imperfection including dissipative advertising, increase of entry fees C_S or give buyers information on sellers' histories. None of these is found to be more effective as signaling by delay. Also when compared with a Walrasian setting as in Akerlof (1970), no market steady-state-equilibrium exists with high-quality goods, and for non-steady-state equilibria again "*there must be delay between when high-quality goods enter the market and when they are sold*" (Biglaiser 1993, 216).

Biglaiser (1993) demonstrates in his study that a market with middlemen in equilibrium is 1) a segmented one where all high quality products are traded through middlemen, while nearly all low quality goods are offered directly by the sellers; 2) middlemen have no reason to act fraudulently; and 3) the sunk costs in the product quality inspection skill or technique can be quite high. This would imply, among other things, that 1) intermediation will be more manifest in markets with considerable product quality dispersion and a large absolute share of low quality products; 2) inspection costs for buyers are prohibitively high; 3) transaction costs for the meeting process are low. The examples given for such markets are those of fine art, jewellery, cars, coins and stamps. All in all, the existence of middlemen is found to be welfare increasing under several plausible conditions. This is due to their ability to diminish transaction frictions by lowering search costs or by increasing purchasers' confidence about the quality of goods. Intermediation arises endogenously whenever middlemen can utilize an informational advantage over other market participants.Quan and Quigley (1991) also stressed this for the case of real estate markets. They modelled transaction prices as noisy signals, reflecting imperfect information. Their valuers are formalized as signal extractors that can build up proficiency by observing many transactions. Biglaiser (1993) and Li (1998) stress that the prerequisite for becoming an intermediary is the sunk cost investment in the ability to detect quality and the ability to pay comparatively low investigation costs to get a high quality product unit for resale.

By way of concluding this section: we can expect to find middlemen in a specific market – such as the real estate market – subject to private information in that market and specific investment costs incurred by the intermediary to acquire the capacity to identify quality. Whether the intermediary improves overall welfare will be contingent on his relative efficiency and the costs of his activities to the economy. In realty markets, we find not only severe information imperfections but also valuer specific investment in education, training and software to access and analyse relevant market data to assess the quality of land – all of

which are considerable investments for the valuer in addition to per item inspection costs, which are lower than those an irregular buyer would incur. This theoretically justifies the valuer's role in the market and answers most of our questions in economic terms – except the one regarding the regularization of the valuation profession.

Therefore, we need to recall that, although valuers as middlemen solve one imperfect information problem, they create another one. The mediating service of the intermediary defines two new internal relationships to the transaction – one of the middleman with the seller and another of the middleman with the buyer – something shrugged off in the intermediation literature with the assumption that the middleman is effectively punishable by an unsatisfied client. The buyer's strategy of information acquisition using a middleman is only efficient in Biglaiser (1993)-like models if there is a strategy for overcoming the agency dilemma in these inner relationships between clients and the middleman. When punishment by the client is not plausible, the new PA dilemma becomes evident – in our case, the valuer being the agent of his client who, as principal, pays a fee for the valuation report but cannot observe how much effort the valuer is putting into the surveying – Rudolph (1998) gives an overview of the literature that applies adverse selection and moral hazard problems to such internal relationships between valuers and clients. Moreover, we can conclude that the existence of middlemen solves the information problem in the first tier relationship between the buyer and the seller only if we assume that both these parties consider the valuer's report to be a reliable source of information. *Nota bene*, if the seller does so, the information advantage is lost to the middleman. For the seller to have an incentive to give up the information advantage, she must trust in the report of the valuer, who must increase her benefit from accepting the valuer's price quotation as compared to the costs incurred by her alternative option of searching for a buyer, who does not request to involve a middleman.

We conclude, then, that the valuer as intermediary is more than an information broker in the realty market. In other words, the valuer needs to be a trusted expert with commonly acknowledged credibility. This prompts us to consider also the credibility problem in the internal relationships of the valuer as agent with the market participants as principals: a welfare-improving role of an expert as middleman in the economy depends on a solution of this principal agent problem in the internal relationship, in particular if the 'expert' and 'credibility' role were related to a potential credence good problem. This is what we call the second tier in our cascade of information imperfections.

3.4 The valuer as trusted expert

Involving a middleman as a trusted expert whose job is to produce information for all interested parties creates another rather specific risk, especially if we understand the valuer's report as a credence good which, according to Darby and Karni (1973), is a good purchasers want to obtain but whose quality they are unable to assess even after usage. These goods are said to invite fraudulent behaviour by the supplier who is able to exploit an informational advantage vis-à-vis the client (cf. Balafoutas et al. 2013).

The credence good problem has been investigated from different perspectives (see for example Dulleck, Kerschbamer, and Sutter 2011, Marty 2001, Bonroy, Lemarié, and Tropéano 2013). Waibel (2013) explains that experts who are able to obscure effectively the quality to customers can utilize this information advantage. He gives examples of markets with credence goods such as the following: medical services, where the doctor can assess the patient's health status professionally better than the patient himself (see for example Iizuka 2007); car maintenance, where the mechanic only knows the repairs that are actually needed (e.g. Dulleck and Kerschbamer 2006, Hubbard 1998); taxi transportation, where the taxi driver knows the best way to reach a destination, unlike the passenger (Balafoutas et al. 2013); and lawyers' advice, where the lawyer is more knowledgeable about the likelihood of success in a lawsuit (see also Dulleck et al. 2012). As Dulleck, Kerschbamer, and Sutter (2011) explain, a typical feature of credence goods is that buyers cannot evaluate whether the quality of their purchased service or good is what they actually needed. As Emons points out: "*Sellers not only provide the credence good, but they also act as experts determining the customers' requirements, simply because consumers are unfamiliar with good in question*" . In the realty market case, the clients cannot judge whether or not the valuer's statement is correct, but if all parties agree to trust the middleman, they are likely to accept rather than to challenge the information he provides. Additionally, clients might not even be capable to detect *ex post* which quality they have actually acquired. A professional supplier, conversely, can ascertain the quality by conducting a market analysis. The supplier of, for example, a valuation service can therefore offer the precise quality (of his service) and charge for it accordingly; the supplier might, however, take advantage of this information asymmetry by deceiving the client (e.g. by producing a market value assessment without a thorough investigation).

Dulleck and Kerschbamer (2006, 35) describe institutions as solution to the credence problem. They argue that "*market institutions solve the fraudulent expert problem at no cost if (1) expert sellers face homogeneous customers, (2) large economies of scope exist between diagnosis and treatment so that expert and consumer are in effect committed to continue with a treatment once a diagnosis has been made, and (3) either the type of treatment is verifiable or a liability rule is in effect protecting consumers from obtaining an inappropriate inexpensive treatment.*" If we compared these requirements with the service provided by a valuer in the real estate market, we can certainly justify the assumption 1) of homogeneous customers as they all are likely similarly interested in the estimation of the true product quality and report of the respective market value. Regarding 2), we also can justify that there is no alternative to the consultation of the expert to ascertain the needed information. However, regarding 3), we have doubts that the results of the service, i.e. the valuation report, will be truly verifiable. Hence, there must be a reliable liability rule to protect the valuer's client and solve her problem of non-observability of the quality of the valuer's work.

3.5 Interim conclusion: Real estate valuation as a cascade of imperfect information

We have shown that the key to the evolution of valuers as an economic institution is to be seen in the multiple imperfections of information in the real estate market arising from the complexities of both the good and the market. Recalling the famous 'lemons problem' of adverse selection (Akerlof 1970), we know that the willing buyer needs to find a strategy to acquire information and that the heterogeneous, durable and irregularly transacted good 'land' is frequently likely to prompt expert intermediation as a promising means of resolving the 'lemons' problem in real estate markets. The intermediation literature has confirmed in theory the welfare improving properties of middlemen. The obvious advantage of a professional real estate valuation intermediary is his ability to compile and continuously update knowledge regarding the complexities of the real estate market and its manifold uncertainties in order to reduce the information gaps and establish the quality of the economic good 'land'. The valuer provides market participants with information on the quality of the property and its corresponding value, which increases their shared utility by reducing frictions and potentially also avoiding 'market collapse' due to imperfect information. The valuer is able to do this on account of having invested in a number of fundamental skills (e.g. real estate appraisal and economics) and having acquired an

observation technique (accumulated market observations) which is far cheaper per unit for him to apply than for any of his clients. However, the costs of employing the valuer for each transaction in the market and, more importantly, the risks of fraud and of trusting the real estate valuer (credence) must also be considered. Table 1 summarizes our interim results in a comparison of the real estate market with and without valuation intermediaries.

Table 1: Comparison of markets with and without valuers as intermediaries

Market without valuers as intermediaries	Market with valuers as intermediaries
Imperfect information causes adverse selection and the 'lemons' problem	Mitigation of the 'lemons' problem by improving information on the quality of the land
Agency problem between buyer and seller	Agency cascade between buyer and seller and between valuer and client
Parties have different strategic options to overcome agency problem	Principal agent problem regarding the estimation of product quality, in particular market risks, between seller and buyer is solved by intermediation of the valuer
High information seeking and processing costs	Advantage due to economies of scale, education and experience that reduce costs of screening the product quality of land
Parties act in their own interest	Parties act in their own interest but put 'trust' in the expert valuer, who must be punishable
Long matchmaking time between buyers and sellers	Matchmaking time shortened due to intermediary
Low market size or even collapse	Increased market size

As we probe more deeply into the PA problem we find that the buyer is the weakest link in a cascade of imperfect information due to her complete lack of site and market specific information. In the first tier, we can assume that the seller has at least some informational advantage because of the previous ownership of the land. The introduction of the valuer as an institution to overcome this shortcoming, however, gives rise to a new internal asymmetry that entails the valuer becoming an agent in the second tier of informational imperfections. As a result, the buyer becomes "doubly-marginalized" (Lerner 1934). As both parties, seller and intermediary, can extract information rents in the chain of supply, the end customer has to pay a twofold 'mark-up' price (in analogy to Lerner's supply chain of monopolies). Hence, the buyer's strategy of information collection via intermediation in the first tier is only efficient if the PA dilemma is also satisfactorily resolved in the second tier. Moreover, whereas at first sight it may seem that the valuer as a middleman may need to consult the seller to a certain extent, we do not expect a full information rent on the part of the seller. The reason for this assumption is that land is a

complex good: even if the seller possesses some site-specific information advantage, we have also learned that the seller cannot know everything about the good's characteristics – in particular the seller is most likely not knowledgeable about the market risks for land lacking a specific information technology. This puts the strong position occupied by the seller in the first tier into a new perspective. A particular seller will have certain knowledge of the characteristics of the specific site as it evolved on the basis of the history as the land's owner, and she might even know that there is a 'market shadow' from past activities on the land, but the seller is certainly not aware of how the market will reflect this shadow economically – nor indeed any of the other determinants in the valuation that the valuer alone, as a professional intermediary, can detect. So to obtain this improved information the seller, too, has to enter into a relationship of some dependency with the valuer.

Can we conclude that intermediation by the valuer improves welfare despite the imperfect information cascade that has now been illustrated? With the buyer and seller on the first tier and the valuer entering on a second tier, we have identified different agency constellations and potential dilemmas. These dilemmas are resolved in orthodox economic models by stating that the work of the valuer must be punishable. The credence good literature further indicates that liability might not be sufficient, but that the valuer needs to have other incentives to report true quality and remain trustworthy as an expert.

This leads us to the institutional embedding of real estate markets and the evolution of the valuation profession (cf. Figure 2). We can assume that informal and formal rules are not only incidental to the market setup but that they have evolved as a key to reducing the incentives of valuers to take advantage of their clients. In the next section, therefore, we will discuss the valuation profession as broader setting of regulations and standards that serve to regularize a valuer's activities. In doing so, we seek to understand if such associations and standards might have emerged as evolutionary institutional responses to the credence good problem and/or as responses to the specific characteristics of land as economic good.

Figure 2: Simple property market framework with information intermediation and regularizing institutions

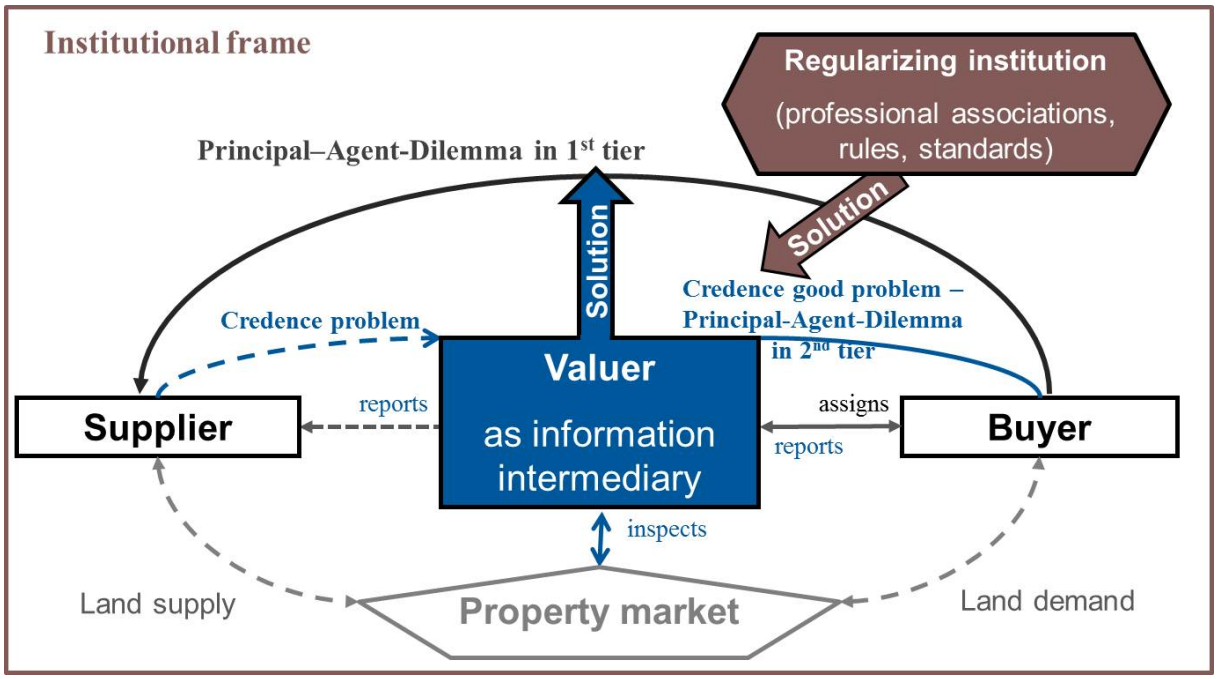

Figure 2 presents a simple property market with valuation intermediation and regularizing institutions solving principal-agent-dilemmas due to imperfect information in two tiers, namely first between buyer and seller of real estate, and second between valuer and client of a real estate valuation report.

4. New institutional economic approaches

International standards, legal definitions of market value and guidance regulation on approaches to valuation or policies of qualification and certification regularize the valuer's activities. In order to better understand if these might have emerged as evolutionary response to the cascade of information problems exposed in Section 3, concepts from New Institutional Economics (NIE) have been reviewed in order to present here those approaches that help deepening our understanding for the evolution and the role of valuers and their regularizing institutions. Our understanding of 'institutions' follows Vatn (2005, 83), who having revisited and discussed definitions by various researchers concludes: "*Institutions are the conventions, norms and formally sanctioned rules of a society. They provide expectations, stability and meaning essential to human existence and coordination. Institutions regularize life, support values and produce and protect interests.*" Vatn stresses that institutions are responses to problem situations, such as complexities in the world demanding coordination which in turn can be established by the institutional type of conventions. In this way, institutions are not merely constraints to behaviour, but they also provide opportunities to find solutions for the problem situation.

The institutional perspective is not new. Stigler (1961, 224) already lamented: "*Some forms of economic organization may be explicable chiefly as devices for eliminating uncertainties in quality. The department store* […] *may be viewed as an institution which searches for the superior qualities of goods and guarantees that they are good quality*" – which reminds us that several scholars, although being assigned to an orthodox economics canon, have pointed to the role of institutional settings impacting the specific market system. Indeed, formal institutions such as laws and contracts have long been understood to affect economic performance (Eggertsson 1990).

Our discussion focuses on two strands of NIE literature: the evolution of profession networks, in particular as discussed by Jaffe (1988) and (Ramsey 2004), and on the asset specificity of natural, complex goods that determine the emergence of regularizing institutions (in particular refering to Hagedorn 2008).

4.1 The evolution of the valuation profession

Departing from a shared understanding that the role of valuers is to reduce imperfect information about trading options of real property, Jaffe (1988) offers a concept of the

evolution of the profession of valuers in networks of experts. Based on a comparative analysis of the emergence of other professional networks, including U.S. associations of dentists, lawyers and accountants, and their respective rules for professionalism, ethics, standards of behaviour and self-regulatory policies, through the last one and a half centuries he finds parallels of 'critical stages' in their professional development traceable along the conceptual life cycles stages of trade associations from an early preorganisation stage marked by the creation of first educational institutions for future cohorts of specialists, via the establishment of a nationwide association, its growth and adaptation ability by reorganisation, to becoming acknowledged for generating tangible results till the development of a stable structure which comprises high standards for ethic requirements and special training bodies.

Complementing our previous analysis, Jaffe's discussion provides a picture, based on rich anecdotal evidence of the phases of the emergence of the valuation profession. It indicates that alternative forms of organisation might initially compete in the regularization of the profession of valuers.

In a similar but unrelated conceptualisation of professional practice of real estate valuation, Ramsey (2004) ascribes valuers with the task to provide a market value assessment, which is seen as a standard and as such as a prerequisite to match the activities and interests of market agents. The standard is to give orientation where price signals do not operate due to the complexity in the market. This complexity is said to be linked also to the organization of the market. It is argued that similar to health professions, a public/private network form of organization is best suited for the valuation profession in order to inform the other market agents, who are said to be to rarely involved in transactions to being able to interpret price signals on their own. Ramsey (2004, 354) explains that a network is an organisation type that can solve problems not handled by firms or the market: "*In this account, a profession is a network of strategic alliances across ownership boundaries among practitioners who share a core competence* […] *the network provided an enforcement agency that maintained members' adherence to standards. Likewise, members of the network were protected against the ability of rival providers to 'cheat' against the standards and provide opinions of value that were 'made as instructed' for the interests of a specific client*".

Ramsey (2004) defines two tiers of the professional valuer's role, one of providing information between the seller and the buyer (imperfect information tier) and the other between market parties and public purposes (e.g. taxation or ethics at the so-called 'fiduciary' tier). The latter can be seen as a result of the good characteristic of land to resolve

the problem of principal non-observability of the quality (and market risks) of land in our terminology. Ramsey's findings give in addition to Jaffe a good illustration of the emergence of the valuation profession as an institutional response to the information imperfection in the first tier. We learn that professionalization in networks enforces certain self-control and facilitates the emergence of standards, which not only the professionals themselves adhere to, but which moreover contribute to an institution's efficiency. Networks and standards have been demonstrated by Endres and Schwarze (1993) to benefit also the consumer side, as it reduces their transaction costs in selecting a proper valuer. Ramsey (2004) demonstrates how professions emerge as networks in order to tunnel competing methods (here of property valuation).

4.2 Nature related transactions

New Institutional Economics theory on transactions has been promoted increasingly to deepen the understanding of socio-economic systems in the previous decades (Williamson 2000), moreover, the institutional analysis of decisions relating to environmental resources and nature gained growing interest (for the case of land see in particular Bromley 1996, Hagedorn 2008). Having discussed the specificity of real property as an economic good in Section 2.1, we take finally a closer look at this literature as it allows us to gain further insights into the role of the valuers' accompanying organizations and rules. For example, Williamson (1981) concluded that specific characteristics of good and transactions (such as asset specificity, uncertainty or frequency) explain the extent of transaction costs and respective institutions which develop as mechanism to reduce these transaction costs.

We identified transactions being characterized by incomplete information as a key for the explanation of valuers as intermediaries. However, we simply assumed a transaction as the (repeated) process of buying or selling of a particular good of interest, including the actions needed to initiate and conduct this process, for example search, matching and negotiation. NIE scholars have expanded our understanding of economic transactions in particular when they are 'nature-based' as in our case land. Williamson (1985, 18), Ostrom (2005, 22) and Hagedorn (2008, 358) stress the importance of the physical element of transactions comprising biophysical and technical specificities. Hagedorn (2008), in particular, stresses the need to analyse the institutional context of transactions of nature-related goods.

Following Hagedorn (2008), transactions can be defined in general terms as economic processes by which goods and services, resources and amenities, and damages and nuisances are allocated. They usually cause interdependencies between rationally deciding actors, but notably can and usually will also interact with the physical environment so that the social and the physical systems' interaction is integral to transactions. Notably, transactions are understood to not merely affect the supply and demand side – or an intermediary agent's actions – in an institutional arrangement, but they are assumed to have more far reaching impact on third parties and the 'situation' of the transaction itself including the location and its physical dimensions (cf. Ostrom 2005), so that transactions according to Hagedorn (2008, 362) in particular in the case of nature-based transactions "*comprise processes of self-organisation in ecosystems not completely engineered by humans, but often influenced or even disturbed by them*", whereas Williamson (1985, 1) defines: "*A transaction occurs when a good or service is transferred across a technologically separable interface. One stage of activity terminates and another begins*". Referencing himself to Schmid (2004), Hagedorn further clarifies that moving a physical object between actors is not a premise for a transaction: "*Selling or leasing land does not mean that the land is physically moved. The only requirement for an action to be also called a transaction is that the actors involved are affected due to a physical implication*" (ibid, 362).

As the author further states, governance structures, such as contracts, bureaucracy, cooperative societies or markets, are organisational realisations or 'institutional forms' that support the efficacy of the transactions by securing privileges and liabilities and by coordinating transactions. Hence according to Hagedorn, we can derive from the set-up of transactions how institutions develop into actual governance structures for determining human (inter)actions at the individual and the level of professional organisations. As a result, distinct institutions and governance structures evolve in order to allow for the 'regularization' of the interdependencies between all actors who are affected by these transactions (including those external to the contract of selling and buying of land). This approach allows a deeper understanding of the valuers' role and the role of professions in the property market.

Hagedorn (2008) shows how physical transactions become institutionalized in a process of stylized stages. "*Institutionalised transactions represent transfers of entitlements or constraints on goods or resources which implies that they become regularised by institutions and governance structures*" (ibid, 363). Departing but going beyond the good's characteristics (e.g. credence goods) he considers all further transaction properties

('externalities'), which can and usually are in miss-alignment with specific institutional arrangements to resolve the market actor's needs ('internalities'). In other words, the socio-ecologic-economic perspective forbids the exclusion of market externalities and claims that any assessment of a nature-based good, such as soil, is causing third party impacts – not only those 'unpriced' by the market, but also those 'unseen' by the market.

Hagedorn (2008) develops a concept that "*establish*[es] *causal relationships between natural system attributes, transaction properties and social constructions for regulating and governing nature–human interactions and actor interdependencies*" (ibid, 371). Emphasising that "*properties of transactions depend on the attributes of physical systems, particularly those of the targeted part of the system, but also often of the wider context of the system in which the transaction is located*" (ibid, 371), he proposes a modular and decomposed analysis of the structures and interdependences. The analysis of social–ecological systems (a terms he takes from Ostrom 2007) detects the relevant interdependencies that incentivize and frame the actions of (e.g. market) actors who themselves are subjected to diverse governance systems. These again are interrelated with a resource system in terms of 'situation' which in turn provides implicit or explicit incentives (e.g. prices in the case of a market) and/or constraints for the activities of actors according to the set of rules found in diverse governance systems (Ostrom 2007).

As a conclusion of his examination, Hagedorn (2008) suggests the framework of the 'transaction-interdependence cycle' with the transaction as unit of analysis in physical and social contexts. The cycle consists of eight elements, which are described in Table 2 as in Hagedorn (2008, 377ff) and applied to the case of a real estate transaction, where a valuer is consulted.

Table 2: Transaction-interdependence-cycle phases and real estate example

Phases of the transaction-interdependence cycle*	Real estate transaction example with valuer
Actors choose an action that entails transactions involving one or more actors	Site owner wants to sell a derelict piece of land with supposed contamination to residential re-users (if a positive value can be realized). Potential buyers request site clean-up and reduce willingness to pay due to uncertainties. A valuer is to assess price.
Such choices lead to a transfer of resource units or they affect ecosystem components by resource users	Transfer: Current (in-/formal) users have to find another plot of land / new residents transfer taxes to local municipality (away from older one) | Impact: Soil sealing as foundations for new buildings (negative) / decontamination (positive)
They may also impact on the wider context of the physical or natural system	Ecological succession process stops. Remediation of groundwater improves land value – ecological and economic. New use entails increased traffic to site.
Ecosystems or hydrological systems respond to the changes by adaptation processes	Change of micro climate; infrastructure connections impact subsoil and groundwater level; storm water treatment could be altered
The outcomes affect other actors: a physical transaction occurs	Neighbouring stakeholders experience change of view, will be impacted by increased traffic; community benefits from increased tax revenue and perhaps reduced crime related to the brownfield
The relationship between the actors participating in the transaction changes as they recognize their interdependence regarding the use of the natural system and respond to it	Stakeholders realise conflicts, e.g. due to increased traffic or dread of release of contaminants or due to (potentially) remaining pollution level after 'remediation' – or options, such as new jobs or safer community. Stakeholders have different views on which impacts the property owner is to bear and which the society, which should be reflected accordingly in the market value
This stimulates interaction between actors directly and indirectly such as discussion, negotiation, consensus-building on rule-making.	Discussion on suitable remediation technology and acceptable pollution level. Planning of traffic and transport. – Discussion on fair market value of site and value impacts. – Discussion in valuation profession on which impacts to include in market valuation – consultation of environmental experts to specify diminution from contamination risk might be needed?
Adaptation processes in the social system result in institutional change and new governance structures	Rule established that a trusted expert is to estimate extent of the impacts and asserts the market value. Regulations in the society determine fiduciary role of the valuer and implement enforcement/ sanctioning mechanisms to prevent malpractice (such as abuse of superior credence role). The professional associations mature in their efficacy to handle complex valuation questions, such as the integration of perceived risks due to (potentially) contamination.
* Source of row's content: Hagedorn (2008, 377-379)	

4.3 Interim conclusion: Valuers as evolutionary successful form of organization for price and quality detection in transactions of land

A nature-based transaction can entail controversial outcomes – as in our real estate example the current owner, investor – and if integrated further stakeholders – debate on the adequate remediation level and on its impact on property value. We conclude from our discussion above that all stakeholders lack sufficient information to negotiate a fair market value and that a solution to this problem can be the consultation of a valuer as a trusted expert, which is

reflected in his mandatory relation with a professional network. As Hagedorn (2008) reasons, an institutionalized transaction context – such as in our case the social credibility of the valuation profession – will guide actors in their selection of options – i.e. consulting a valuer to ascertain market value – reflecting the rules and enforcement mechanisms – implausibility of being duped by the valuer. "*If the actors involved accept the outcomes of the public and private ordering achieved, the transaction-interdependence cycle will end, otherwise it may start afresh and lead to additional institutional and organisational change*" summarises Hagedorn (2008, 379) – in our case, we understand the emergence of the valuer as information intermediary in combination with the regulations and organizations that enforce the valuer's reliable sanctioning of any miss-use of the superior expertise, in particular the maturing of professional networks, as the outcome of the transaction-interdependence-cycle solving the information imperfections in the first and second tiers. Moreover, the development approach allows for adjustments in case of changes in a system's progressing, e.g. external shocks as described in the concept of technological transitions by Geels (2002).

The presented NIE concepts indicate that there has been evolutionary competition between different forms of organising human interactions and the transaction of natural resources such as land. Those institutions that mature after decades and centuries seem to offer superior properties as compared to alternative settings. As already Fama and Jensen (1983, 327) argued: "*Most goods and services can be produced by any form of organization, and there is competition among organizational forms for survival in any activity. Absent fiat, the form of organization that survives in an activity is the one that delivers the product demanded by customers at the lowest price while covering costs.*" As Fama and Jensen (1983) point out, successful organization forms are able to tackle agency problems related to the enforcement of contracts. The authors point to specific transaction costs, which are the source of organizational performance and endurance. – If we therefore find the valuers and the valuation profession as internationally broadly established form of organization, we can conclude on its superiority to other forms of organization of the price determination task.

5. The empirical dimension: The case of contaminated land in Brandenburg

To illustrate our discussion, we introduce a brief empirical case of the economic effects of institutional regularization of the valuers' functions in a nature-based context on land transactions. This example, moreover, provides a realcase of Akerlof (1970) 'lemons': The case of land affected by contamination is an example of imperfect information that leads to near collapse of some segment of the property market. Although many risks cause imperfections regarding the real estate market, the effect of potential contamination is of greater heuristic value as it neatly separates otherwise alike properties and points to the risks of difficult to observe quality conditions of property. Jenkins, Kopits, and Simpson (2006) state that informational asymmetries and problem owners' concerns with (potential) liability are well documented in the literature on economic valuation of land. Often, the largest single problem is seen in the potential (as opposed to actual) liabilities (cf. Bartke and Schwarze 2009). Contamination should be considered 'low-quality' of land with resultingly reduced market-clearing prices. In other words, we study a situation, where a professional expert intermediary should – according to our theory – ensure that a market equilibrium with trade is established if institutions are set effectively.

Existing standards (such as USPAP Appraisal Opinion 9, cf. Board) and professional networks address the complexity of the appraisal challenge, however, their advice on when to use which particular valuation approach to appraise diminution in land value due to perseived uncertainties is at best vague. In practice, uncertainties and contaminations are often excluded from a valuation mandate or integrated 'simplified' in rule of thumb-approaches due to limitations in time and budget to carry out a sophisticated valuation including clarification of the information and quality risks (Bartke 2011). In other words, the existing institutions seem not to fully effectively demand the integration of negative externalities on the market value of sites (potentially) affected by contamination.

What happens, if valuers and regularizing institutions for intermediation exist in such a market, but where these actors (the valuers) do not have – or are incentivized not to use – a sufficient technology of quality detection (here risk assessment)?

We studied this situation in the German Bundesland (federal state) 'Brandenburg', where the former military sites concentrated after German reunification. Until 1989, approximately 230,000 hectares of the area of Brandenburg, which is enclosing the formerly divided city of Berlin, was under military usage, nearly one half by the Soviet army. We

investigated transactions of the state-owned 'Brandenburgische Boden' (BBG) within a project funded by the German Ministry for Education and Research. BBG took over 100,000 hectares of former Soviet army real estate in order to put it to the market after hazard defence measures. Due to the historic use, all sites are common knowledge to bear a potential contamination. To determine the minimum selling price – being obliged as state company to the public interest – BBG assigned or consulted professional valuers to provide market value assessments of their sites.

In 2007-8, a dataset of 480 effective transactions to private or public investors was collected from BBG archives. For 190 of these cases, a full valuation report with market value estimation was available – in the other, mostly more 'simple' cases, such as forestry land of former combat training grounds, BBG in-house experts formed value assessments based on consulting valuers or official committees of valuation experts for comparative standard land values. Table 3 characterizes the sample.

Table 3: Data characteristics of BBG sample

Number of observations	
n (total)	408
n_{VR} (valuation report)	190
Types of buyers	
Private investor	44.1%
Owner-occupiers	26.2%
Municipality	15.2%
Public owned company	5.4%
Types of tendering	
Direct contracting	73.5%
Public invitation to tender	24.3%
Location*	
Within municipal inner-city planning area	37.7%
At border of planning area	25.0%
Outside of planning area	34.3%
Notes: *These are categories according to German planning regulation. *Source:* Author compilation based on sample of 408 cases of BBG.	

The BBG data shows long holding periods for their sites – on average (and median) 6 years. Correlation analysis – results presented in Table 4 – indicates that increasing holding time goes with an increase in the perceived probability or severity of contamination. The latter was assessed by the authors using a simple scoring of 3 = many potential contamination spots and/or probable groundwater pollution documented; 2 = only single and spatially limited spots known and no groundwater pollution expected; 1 = remediation completed or

no indication for potential contamination; -1 = excluded due to lacking information. The scoring was based on the information available on the site's history and site investigation documentation available in the archive. Correlation holding time against this measure of perceived contamination reveals a quite strong (Person coefficient is +0.324) and significant (at p <0.001 level) impact. Notably, the effect is considerably larger as for the location, price and rebate dimensions (where more remote locations, cheaper prices and larger rebates correlate in intuitively directions with an increased holding time). The type of tendering is not found to have a significant impact on the holding time (indicating to 'special' contract treatments in direct tenders).

Table 4: Correlation coefficients of holding time and other variables

		Worsening location (from inside to outside of planning area)	Total price in €	Subjective extent of contamination	Rebate for contamination situation	Type of tender (direct contract or public tender)
Holding time in months	r	0.145	-0.184	0.324	-0.167	-0.039
	σ	0.004	0.000	0.000	0.001	0.442
	n	396	408	224	408	399

Source: Author compilation based on sample of 408 cases of BBG.

Despite this significant impact of contamination, only in five of the 190 market valuation reports the market value impact due to the contamination situation has been addressed – in all other cases, the valuation of this denomination factor was put aside assuming a so-called 'as-if-uncontaminated'-situation. BBG used this ´as if uncontaminated-assessments' and deducted forecasted remediation costs calculated on environmental (but not real estate market) specialists' assessment from this value in order to ascertain the minimum sales price. As Bartke (2011) argues, this estimate is times too high as it does not consider a diminution for the mercantile value reduction due to shadow-effects, which for example for areas that have been properly decontaminated on average still accounts to 12.25% depression of the as-if-clean market value. At the same time, it was general knowledge that the former Soviet used sites were likely to be affected by pollution. As a result, the properties were too expensive for average buyers – explaining the high holding time.

In this data we find a real situation, where the BBG as supplier in the market consults a valuer and puts trust in his valuation results where research clearly demonstrates that his valuation methods are incomprehensive. As a result, we find a market that is drastically

reduced in size – a real lemons problem. Only with very long marketing periods properties find a buyer (or still remain in possession of the supplier who assumes she is offering at a fair market value and wonders why she cannot find a willing buyer).

We can conclude from our little example and discussion above that in the case of contaminated land valuation in Brandenburg, the transaction-interdependence-cycle has not yet arrived in a stable situation, but improvements such consistent appraisal methods for contamination risks still has to enter the scene (e.g. as standardized and encouraged valuation method by the professional associations and international standard committee).

6. Conclusions

Valuers as information intermediaries provide vital services to 'land-related' sectors and stakeholders of the economy; but their services are regularised in terms of professional rules and regulations. We have demonstrated that such regularization is a socio-ecological response to a cascade of principal agent problems due to imperfect information settings.

We provided a characterization of 'real estate' as an economic good with specific physical and economic properties, where transaction costs arise from the need for information in order to determine the product quality and the related market value. Our conceptual analysis confirms that information intermediaries can reduce such transaction costs, which in turn explains their existence and a positive willingness to pay for their services by clients - which in turn indicates a potential of welfare improvements due to their existence. This also allows valuers as information intermediaries to invest in a specific 'detection technique' that allows them to observe the 'product quality' of land and translate this into a market price. The market of real estate can thus be characterised as durable experience goods' market in terms of Nelson (1970).

Departing from Nelson's concept of experience good the market of real estate can be economically improved (in terms of higher utility) by the existence of an institution that offers guidance (i.e. the valuer). The valuer reduces uncertainties for his client. For the client the benefits can be assumed to be larger than the costs, thus net-beneficial. However, it results in a client–valuer internal relationship, which is evidently facing asymmetric information and needs trust, i.e. it has potential of developing into a credence good. The valuation assessment is accepted as a price by market participants only if they trust the valuer, as otherwise the credence problem would occur. Solving the problem of imperfect information in the first tier (land as durable experience good) creates another imperfect information problem (trust into the valuer) as a second tier problem.

Understanding the valuer in terms of this cascade of imperfect information, we find that credence and fiduciary problems are key also to understand the evolution of the valuation profession. 'Land' is a nature-related transaction good in terms of Hagedorn (2008), which tends to bring about expert intermediaries and their associated organisations as institutional solution to the information complexities. The international emergence of a valuation profession can be understood as evolutionary response to ultimately limit the second tier information problems between an individual valuer and his clients and further stakeholders.

In the end, the orthodox economic approaches to reals estate valuation do not become obsolete but integrate into a socio-ecological framework of transaction economics. Here we find the emergence of regularizing organisations as a first order condition for an effective functioning of the valuation process in the absence of punishment or incentivizing means to guide the behaviour of the valuer. This again demonstrates that neo-classical and new institutional economic approaches are not mutually exclusive, but that there are bridging concepts, such as in our case the 'credence' concept, to link these strands of economic theories.

This paper could only discuss a limited set of aspects. Most prominently the question remains, can we positively judge the existence of the valuer as economically efficient? So far, we are only able to prove that the market alone (without an expert intermediary) faces the risk of 'collapse' because of lacking information, specifically in the case of complex nature-related transactions. Our empirical case of contaminated land demonstrated that lacking information are significantly correlated with increased holding periods, In other words, we find the risks of a real 'lemons' situation in real estate. However, we also found that that the valuation networks are themselves at risk of lacking information as they have not agreed on the selection and enforcement of standards to the valuation of such contamination risks. This emphasises the finding of Ramsey (2004, 375) that "*the real estate appraiser is also challenged by problems where there is simply no typical market practice. In these latter cases, the legitimate role of the appraiser is to innovate in terms of methods and principles. In this type of problem situation, the appraiser has the opportunity to lead the market but often encounters constraints in the form of the objection that there are no market transactions that support their inferences.* [… Here …] *innovative techniques are most necessary*" – and we are confident that they will emerge sooner or later.

The institution's understanding by Vatn (2005) and (Hagedorn (2008)'s)transaction-interdependence-circle emerges as a consequent step to further our understanding of the economic role of the valuer. It allows translating the existing 'cascade of information imperfections' into the evolutionary emergence of a regularizing setting of the valuation profession, its organisations, standards and regulations to address the quality assessment and the credence problems. In other words, it integrates the neo-classical approaches to real estate valuation into a holistic transaction economics' approach rather than putting them mutually exclusive.

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